

Three-Year Implementation Tracking Progress Report of the Morro Bay Sediment Total Maximum Daily Load (TMDL)

Listed Waterbody: *Morro Bay, including Los Osos and Chorro Creeks*

Listed Condition: **Sediment**

Progress Report: **Implementation Tracking**



This progress report describes the status of implementation of the Morro Bay Sediment Total Maximum Daily Load (TMDL) as of April 2007. On May 16, 2003, the Central Coast Waterboard adopted Resolution No. R3-2002-0051 (Attachment A available online¹) as a Basin Plan Amendment. The TMDL became effective on December 3, 2003 when it was approved as a Basin Plan amendment by the Office of Administrative Law. This progress report represents a three-year evaluation of the implementation efforts of the TMDL. This report addresses three questions; is water quality improving, are implementation measures moving forward, and are there any course corrections that need to be taken?

Is water quality improving?

Staff is uncertain whether sediment water quality conditions are improving at this point because the short term data is inconclusive. Staff anticipates that data obtained over a longer monitoring period will assist in determining any trend in sediment water quality. The TMDL established numeric targets for the streams: pool volume, median gravel size diameter (D_{50}), percent fines in substrate, and turbidity and tidal prism volume for the Bay (see Table 1). However, staff has not received new data regarding these parameters, except for turbidity. Average turbidity values remain below 10 NTUs at all but the mouth of Los Osos Creek, which is tidally influenced (Morro Bay National Estuary Program's Volunteer Monitoring Program VMP Data Summary Report December 2006). The Volunteer Monitoring Program has continued to collect benthic invertebrate samples in the watershed; however Waterboard staff did not analyze these data for this progress report due to time constraints and an inability to translate benthic invertebrate studies to sediment numeric targets.

The Waterboard has contracted with UC Regents, Santa Barbara (contract no. 05-179-160-0) through the State's TMDL and Surface Water Ambient Monitoring Program (SWAMP) to conduct numeric target and benthic invertebrate monitoring in Morro Bay creeks. These data will be available in March 2009 and will improve our ability to evaluate sediment water quality conditions. These data will provide a more direct link

¹ <http://www.waterboards.ca.gov/centralcoast/TMDL/303dandTMDLprojects.htm>

between numeric targets and benthic invertebrates, which will help staff measure the relationship between habitat and water quality more directly. Staff will use this information along with the Volunteer Monitoring Program's benthic invertebrate sampling to indicate temporal water quality changes. The Morro Bay National Estuary Program (Estuary Program) contracted a Bay bathymetry study. This was conducted in the spring of 2006. As of the writing of this report, the data from this study is not yet available but is expected soon. A greater time period, as well as additional data becoming available, will allow staff to make a more informed decision as to whether water quality and habitat are improving and whether there has been a reduction in sediment entering Morro Bay. During this three-year evaluation, staff focused on implementation measures in order to inform the "progress" on this TMDL. All implementation measures are not in place yet and the TMDL is only at year three of a fifty-year timeframe.

Parameter	Numeric Target		
Chorro and Los Osos Creeks and Tributaries Streambed Sediment			
Residual Pool Volume ²	V* = Mean values ≤ 0.21 Max values ≤ 0.45		
Median Diameter (D ₅₀) of Sediment Particles in Spawning Gravels	D ₅₀ = Mean values ≥ 69 mm Minimum values ≥ 37 mm		
Percent of <i>Fine</i> Fines (< 0.85 mm) in Spawning Gravels	Percent fine fines ≤ 21%		
Percent of <i>Coarse</i> Fines (< 6.0 mm) in Spawning Gravels	Percent coarse fines ≤ 30%		
Chorro and Los Osos Creek and Tributaries Water Column			
Turbidity		% of Samples Below Target	Target (NTUs)
	Wet Season	82%	≤ 5
		93%	≤ 100
	Dry Season	96%	≤ 5
Morro Bay Estuary			
Tidal Prism Volume	4,200 acre-feet		

Are implementation measures moving forward?

Yes. Implementing parties such as the Estuary Program, the Resources Conservation District (RCD) and the Civilian Conservation Corps have made a lot of progress in the

² Residual Pool Volume refers to the portion of a pool in a stream that is available for fish to occupy. Pool habitat is the primary habitat for steelhead in summer. Overwintering habitat requirements include deeper pools, undercut banks, side channels, and especially large, unembedded rocks, which provide shelter for fish against the high flows of winter. V* gives a direct measurement of the impact of sediment on pool volume. It is the ratio of the amount of pool volume filled in with fine, mobile sediment, to total scour pool volume.

last three years in terms of implementation measures moving forward. Implementation measures, outlined in the TMDL project report are discussed below (Table 2):

Table 2: Status of Implementation Measures

1	Hollister Ranch Acquisition	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> The Hollister Ranch acquisition took place in 2003 (source: Estuary Program). <ul style="list-style-type: none"> The Estuary Program and the Trust for Public Lands worked together to purchase the 580-acre Hollister Ranch on Chorro Creek. Located adjacent to Chorro Creek, this project has a larger floodplain area than Chorro Flats, and is expected to be an effective means of capturing sediment once levees are removed to restore the floodplain (source: Morro Bay Sediment TMDL). Department of Fish and Game (DFG) is the landowner and the Estuary Program is working with them. (Resource Conservation District (RCD) does not have anything to do with this site. (The tracking table in the TMDL shows the RCD is an implementing party)) (source: Estuary Program). <p><u>What is planned:</u></p> <ul style="list-style-type: none"> A floodplain restoration project will be constructed at this site in 2008 or 2009. The expected sediment capture of the restored floodplains at this site is lower than the Chorro Flats project downstream due to the higher gradient in this reach (source: Estuary Program). The Estuary Program will monitor how much sediment this restoration project captures and share this information with the Waterboard (source: Estuary Program).
2	Los Osos Creek Wetland Restoration Project	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> The Coastal San Luis Resource Conservation District purchased some land here with Coastal Conservancy support and has taken them out of farm production (source: Estuary Program). The site has returned to a floodplain wetlands system and appears to be a successful sediment trap however, a monitoring system to quantify sediment capture has not been established (source: Estuary Program). <p><u>What is planned:</u></p> <ul style="list-style-type: none"> Some design work for additional floodplain restoration has been completed for this area, but at this time the landowner is not interested in selling his farmland (source: Estuary Program).
3	Watershed Crew Curriculum	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> The Civilian Conservation Corps (CCCs) receive training (ongoing curriculum) and the Estuary Program provides funding for them to

		<p>work on restoration projects (source: Estuary Program).</p> <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • Same as above.
4	Catalogue of Erosion Control Projects	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> • There is a GIS database that has a catalogue of erosion control projects. This action is complete (source: Estuary Program). <ul style="list-style-type: none"> ○ This database provides a comprehensive map and list of erosion sites/erosion control projects. However it is not prioritized by cost or sediment contribution. The Estuary Program continues to use it to identify erosion control projects. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • No future plans as this project is complete. However, if the sites in the database are prioritized in the future, it would be a more useful tool.
5	Project Clearwater	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> • This measure is fully in place for the RCD to provide technical assistance and cost sharing to install management measures in different areas (source: Central Coast Waterboard staff). • This project is comprised of a \$500,000 grant that Waterboard staff is managing as well as Estuary Program and Coastal Conservancy grant support (source: Central Coast Waterboard staff). • The table below gives a <u>rough</u> estimate of the projects and management measure put into place in the last six years (2001-2007) (source: Resources Conservation District). The table represents really rough estimates and should be interpreted with a few caveats in mind: <ol style="list-style-type: none"> 1. The conservation project plan is a holistic plan which can included gully repair, re-vegetation, road repair, stream crossings, irrigation system upgrades, tail water return systems etc. All of these management practices affect sedimentation and runoff, and ultimately achievement of TMDLs. Individual management practices in a conservation plan/project work together, cumulatively. 2. There are different types of fencing in a Managed Grazing Plan: cross fencing and riparian fencing. The Natural Resources Conservation Services' practice descriptions do not distinguish between the two types. The RCD has only recently tried to track this. Tracking riparian fencing in feet and by acres is a very recent development.

			PROJECT/BMP DESCRIPTION 2001-2007	UNITS	~ TOTAL
			CONSERVATION PROJECTS IMPLEMENTED	NUMBER	45
			CONSERVATION PROJECTS PLANNED/ IMPLEMENTING	ACRES	15
			CONSERVATION PROJECTS PLANNED/IMPLEMENTING	NUMBER	22
			PARTICIPATING LANDOWNERS	NUMBER	26
			MANAGED GRAZING SYSTEMS IMPLEMENTED, IMPLEMENTING, PLANNED	ACRES	12,460
		<p><u>What is planned:</u></p> <ul style="list-style-type: none"> To continue to provide technical assistance and cost sharing to install management measures in different areas. This 319 grant ends in December 2008 (source: Central Coast Waterboard staff). 			
6	Agricultural Water Quality Program	<p><i>(The following section is based on a telephone call with the Farm Bureau.)</i></p> <p><u>What has happened:</u></p> <ul style="list-style-type: none"> Kay Mercer (Southern San Luis and Santa Barbara Counties Agricultural Watershed Coalition) has put on a number of workshops in the area regarding management practices related to irrigated agriculture. The Farm Bureau has produced six brochures on management practices. These are handed out routinely during workshops and other meetings and were also distributed in their monthly magazine (one brochure per month over a six month period). The brochures are entitled: <ul style="list-style-type: none"> Filter and Buffer Strips Access Roads Grassed Waterways Self Monitoring of Farm or Ranch Rock Energy Dissipaters Cover Crops The Farm Bureau routinely fields calls from the public. The Agricultural Water Quality Shortcourses are still going on and the Farm Bureau works with UC Cooperative Extension on this. The Watershed Working Groups that were under Farm Bureau coordination are not meeting anymore because they are fairly diversified (different crops for example) and the meetings were not as useful as they once were. 			

		<p><u>What is planned:</u></p> <ul style="list-style-type: none"> The Farm Bureau will continue with public outreach via workshops, brochures, meetings and phone calls.
7	Land Acquisitions and Conservation Easements	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> More than 3,000 acres have been protected or restored (source: Estuary Program). See Appendix One that shows the map on where these areas are (Estuary Program's Making a difference brochure). <p><u>What is planned:</u></p> <ul style="list-style-type: none"> This number should increase in years to come. The Estuary Program will be working to acquire more land and look to implement conservation easements.
8	Fire Management Plan	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> The Fire Management Plan was completed in 2003 and funded by the Estuary Program. The plan has been distributed to the California Department of Forestry and Fire Protection for implementation. This plan calls for prescribed burns to reduce fuel loads over time. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> For the California Department of Forestry and Fire Protection to implement the Fire Management Plan.
9	Maintenance of sediment basins above Chorro Reservoir	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> The sediment basins were cleaned out in '98 and '99. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> Waterboard staff is currently in contact with California Army National Guard (National Guard) regarding how and when the sediment basins will be cleaned out and maintained in the future. California Army National Guard will submit a formal plan to Waterboard staff by June 15, 2007.
10	Road Maintenance	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> County of San Luis Obispo <ul style="list-style-type: none"> Their Stormwater Management Program was adopted by the Central Coast Waterboard in March 2007. Road maintenance issues, and management practices associated with road maintenance issues, will be addressed via their Stormwater Permit. For example, the following specific actions in the Stormwater Management Program include: <ul style="list-style-type: none"> The County must identify heavily soiled areas or other areas that will require street sweeping more frequently than quarterly. The County must commit to track curb miles swept

		<p>and the amount of material collected annually.</p> <ul style="list-style-type: none"> ▪ The County will establish protocols to ensure construction project proponents have coverage under the General Stormwater Construction Permit in permit year one and implement protocols in permit years two through five for BMP CON2b. <ul style="list-style-type: none"> • Public and Private Landowners <ul style="list-style-type: none"> ○ No action that staff is aware of. • Caltrans <ul style="list-style-type: none"> ○ No action that staff is aware of. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • Pacific Watershed Associates, a leader in assessing sediment discharge from roads, is scheduled to complete a roads inventory, assessment, and prioritization in a large portion of the Chorro Creek watershed in 2007. This assessment will take place mostly on public lands such as those owned by California National Guard, Cal Poly and Forest Service. The Estuary Program hopes to use this work as a basis for moving forward with repairing the highest priority road erosion sources (source: Estuary Program).
11	Sediment traps	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> • Chorro Flats is functioning well to retain sediment that was reaching the Bay from Chorro Creek (source Estuary Program). • Hollister Ranch should be complete around 2010 and should serve to retain more sediment further upstream on Chorro Creek (source: Estuary Program). <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • The Estuary Program is working with the Resources Conservation District to assess whether they can resurvey Chorro Flats and generate a current estimate of sediment captured on the site (source: Estuary Program).
12	Primera Mine Rehabilitation and Erosion Control	<p><i>(The following section is based on conversations and emails with the California Army National Guard.)</i></p> <p><u>What has happened:</u></p> <ul style="list-style-type: none"> • The California Army National Guard re-contoured the Primera mine project site and installed drainage conveyance features including drainage inlets and culverts. Rock water bars and other erosion control features were also installed. The site was planted with approximately 8,000 native plants in February 2006 and about 6,000 of these plants remain. To date the establishment rate is approximately 50-60%. National Guard staff continues to manage irrigation for this project (source: National Guard). <p><u>What is planned:</u></p>

		<ul style="list-style-type: none"> • National Guard may perform restoration work on the other mines; New London, la Trinidad, and Pick & Shovel; however nothing has been solidified at this time. • National Guard will continue the work at Primera mine and will be monitored for some time. • National Guard's potential restoration work as well as the ongoing monitoring at Primera mine, depends on additional available funding.
12A	Sediment control on CA Army National Guard Lands	<p><i>(The following section is based on conversations and emails with the California Army National Guard.)</i></p> <p><u>What has happened:</u></p> <ul style="list-style-type: none"> • In 2006, the California Army National Guard upgraded approximately 5 miles of road in the Chorro Creek Watershed by outsloping appropriate sections to shed water off the road rather than down the road. As a secondary measure rolling dips were installed rather than seasonal waterbars. Both of these strategies act to move water off the road prior to acceleration and subsequent erosion and down drainage sediment transport. • Pacific Watershed Associates (Arcata, CA) was awarded a Department of Fish and Game restoration grant for a wildland roads assessment within the Chorro and Stenner Creek watersheds. The project includes prescriptions for actual road improvements as well as culvert replacements if necessary. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • California Army National Guard will use the Pacific Watershed Associates Report to prioritize road projects for Implementation. • The National Guard will continue restoring and sustaining Camp San Luis Obispo training lands. The National Guard has a program that is specifically geared towards restoring and sustaining the training lands. The Program is implemented by federally funded positions through the army sustainable range program.
13	Stormwater Sediment Control on Roads (County of San Luis Obispo)	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> • Stormwater sediment control on roads is covered by the County of San Luis Obispo's stormwater permit, which was adopted in March 2007; however this source is not considered one of the biggest loaders of sediment. The biggest sediment loading is most likely from higher up in the watershed. Landowners include, but are not limited to Forest Service Lands, Cal Poly, CA Army National Guard and Department of Fish & Game. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • As mentioned in box 10, Pacific Watershed Associates will be doing an inventory, assessment and prioritization. This is supposed to happen winter 2007.

14	Stormwater Sediment Control on Roads (Caltrans)	<p><i>(The following section is based on a conversation with Caltrans staff.)</i></p> <p><u>What has happened:</u></p> <ul style="list-style-type: none"> • Caltrans left some vegetative strips in between the highway and the concrete median during the Highway One improvement project to increase pervious area and serve as treatment areas. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • There are no specific construction plans in the next 5-6 years (2007-2012). • Caltrans plans to work on more outreach and coordination with different agencies (County of San Luis Obispo, the City of Morro Bay) and watershed groups (SLO Partners for Water Quality, the Morro Group).
15	Water Quality Management Plans on Chorro Creek Ranches	<p><u>What has happened:</u></p> <ul style="list-style-type: none"> • Cal Poly has addressed erosion control in its Water Quality Management Plan which is enforced through their Waste Discharge Requirements from the Waterboard. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • Continue to address erosion control through their Water Quality Management Plan.
The following couple of items are not specifically addressed in the TMDL Project Report, but have/will contribute to reducing erosion, improving water quality, and reducing the amount of sediment that travels to the Bay:		
A	Individual restoration projects	<p><i>(The following section is based on conversations with the Estuary Program)</i></p> <p><u>What has happened:</u></p> <ul style="list-style-type: none"> • Individual restoration projects have been implemented on: <ol style="list-style-type: none"> 1) Walters Creek on Cal Poly property 2) Upper Clark Valley 3) Walters Creek, lower down 4) Hollister Ranch, stabilizing • All of these projects have before and after photos. These projects were funded with Department of Fish and Game money. Specific restoration measures include planting, rocks, stabilizing failing banks and restoring riparian areas. <p><u>What is planned:</u></p> <ul style="list-style-type: none"> • The Estuary Program has more individual restoration projects planned, however restoration is expensive and takes some time.
B	Riparian	<u>What has happened:</u>

	Fencing	<ul style="list-style-type: none">• The Estuary Program pursued and secured funding to support riparian fencing. A Waterboard enforcement settlement provided a "Supplemental Environmental Project." The fencing should be finished by the end of 2007. The Estuary Program will generate maps of the extent of fencing. <p><u>What is planned:</u></p> <ul style="list-style-type: none">• The Estuary Program will continue to encourage funding and opportunities for riparian fencing.
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Are we on track? Are there any proposed course corrections?

Staff concludes that TMDL implementation is on track because implementation measures have been moving forward. Implementation measures and activities are described in the previous section.

There are no proposed course corrections at this point. However, during the next three year evaluation (2010), Waterboard staff should reconsider whether the numeric targets for this TMDL are the most appropriate. Staff should evaluate appropriate numeric targets because determining the link between sediment water quality conditions and fish habitat can be difficult. In-stream targets are expensive and require more expertise to measure than currently available. Staff recommends taking a critical look at the numeric targets in 2010 as opposed to now because much of the sediment assessment work is in-progress such as benthic invertebrate sampling coupled with numeric target sampling such as Total Suspended Sediment (TSS) and flow. After the next three years, there will be more data available to evaluate sediment water quality conditions related to habitat and an opportunity to re-evaluate TMDL numeric targets.

Attachment:

Appendix One – Map showing restoration and protection project accomplished through partnerships between the Estuary Program, fellow conservation organizations and agencies, and landowners (taken from the Estuary Program's Making A Difference Brochure).